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Safety & Health Monitor, April 1996

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Safety & Health Monitor

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Quarterly Newsletter of the Maine Bureau of Labor Standards

April, 1996

Seven Biggest Misconceptions About Electricity

By Brad Kaherl, Gary Gertloff, and Mark Dyer

As public safety coordinators for Central Maine Power, our main job is to teach electrical safety. We consider our safety talks with community groups, civic organizations and emergency workers as an opportunity to protect customers who might find themselves in a dangerous situation around electricity.

During these sessions, we often hear members of our audience offer electrical safety advice that isn't correct. These misconceptions can give people dangerous ideas about when they are or aren't safe around electricity. To help ensure the safety of you and your family, we have listed some of the more common misconceptions that we've heard. Take the time to review them. It might save your life.

Dangerous Misconceptions

1 "Tires are electrical insulators."

Tires are electrical *conductors*, not insulators. It is true that you are safe in your vehicle when a live wire falls on it. But that's because electricity always takes the easiest path to the ground. It's easier for electricity to travel on the outside of your car, through the tires, and to the ground, than to travel through the inside of the car, through you, to the outside, through the tires, and then to ground. So when an electrical wire falls on your car, *stay in your car until help arrives and the power is shut off by CMP.*

If you have to get out of your car because of a life threatening situation, jump out with both feet, making sure that you are not touching any part of the car when your feet hit the ground.

2 "Power lines are insulated."

Ninety percent of outside power lines are *not* insulated. And the lines that are insulated are also exposed to

the rigors of Maine weather, so you never know what condition the insulation is in. That's why we say, "No line is safe to touch, *ever.*"

3 "Only high voltage is dangerous."

Voltage is the pressure that pushes electricity along, like water through a hose. Amperage (amp), the amount of electricity in any given spot, is what will hurt or kill you. It takes *less than one quarter of one amp* to put a heart into ventricular fibrillation (irregular beating). Most residents have at least 100-amp service coming into their house; many residents have 200-amp service—800 times the dangerous level.

4 "When a wire falls to the ground, it automatically shuts off."

Often when a wire falls to the ground, it falls on materials that are poor conductors like snow, asphalt, or ledge. When this happens, our distribution system senses increased request for electricity. Our equipment can't distinguish between an increase in request for electricity caused by a break in the line or because many people in one area are coming home from work and turning on their electrical appliances. Our circuits are designed to sense shorts—sudden requests for unusual amounts of electricity. If this doesn't happen because the wire has fallen on a poor conductor, our line will remain energized. *Always treat a downed wire as energized until CMP has shut it off!*

5 "When a live wire falls, it makes sparks."

Sometimes. A power line sparks if it falls to the ground and does not make firm contact with the ground or other material. When a wire falls to the ground and makes firm contact, it will often make *no* noise or sparks, and give the impression of being de-energized.

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(Dangerous Misconceptions—Continued from page 1)

6 “Wood is an insulator.”

Wood is a *conductor* but not a good one. The molecules in wood are far apart so it is difficult for electricity to jump from molecule to molecule. But the higher the voltage, the easier it is for electricity to move through wood. And if the wood is *damp*, it changes the equation and wood becomes a *good* conductor, even at low voltage.

7 “Household rubber gloves or rubber soled shoes insulate.”

Only 100 percent *pure* rubber insulates against electricity. Household gloves and shoes are not made of pure rubber. Often to make these shoes more marketable and durable, additives are mixed in with the rubber-like material. That makes these gloves and shoes conductive.

Electricity, while a convenient and clean energy source, can be dangerous. Teach your children to stay away from fallen electrical wires, electrical substations and the service drop to your house (where power lines come into your home). If you are not knowledgeable about electricity, hire an electrician to repair electrical problems in your home. Remember, never get in the way of electricity's constant need to reach ground.

Safety & Health Update

Summaries of Work Injuries and Illnesses and OSHA Citations are now available for the following industries:

- Residential Building Construction
- Highway & Street Construction
- Miscellaneous Special Trades Contractors
- Manufacturing Food & Kindred Products
- Logging
- Sawmills & Planing Mills
- Paper Mills
- Manufacturing Footwear, Except Rubber
- Motor Freight Transportation & Warehousing
- Electric, Gas, & Sanitary Services
- Wholesale Groceries & Related Products

- Grocery Stores
- Automotive Dealers & Gasoline Service Stations
- Hotels & Motels
- Business Services
- Nursing & Personal Care Facilities
- Hospitals
- Residential Care

These one page summaries include Workers' Compensation data, employment data, OSHA incidence rate data, and OSHA citations data. Call (207)-624-6440 if you are interested in any.

Summer Safety Institute for Educators

Every day, in workplaces throughout Maine, young people are starting their first jobs. Many of these new workers enter the workplace without adequate occupational safety and health training. The consequences are sobering:

- Two Mainers under age 24 died at work in 1995.
- In 1995, eight young workers (under age 24) lost a limb in a Maine workplace.
- Young workers registered 2067 lost-time claims in 1995 (16% of all claims).
- Workers on the job less than two years account for over 40% of lost-time claims in Maine each year.

The Safety Division of the Maine Bureau of Labor Standards is committed to increasing awareness among new workers. The Summer Safety Institute for Educators addresses safety and health in the occupational classroom. It is designed for vocational and technology educators, school nurses, facilities managers and administrators with responsibilities for the safety and health of employees and students.

Participants learn to recognize and control hazards typically found in schools and other workplaces. They receive instructional materials to assist them in integrating safety and health into the curriculum.

The Department of Labor awards certificates to participants, their schools and districts, acknowledging their efforts at improving safety and health. The public sector enforcement unit recognizes participation in the Institute as evidence of a district's commitment to occupational safety and health.

The Safety Division offers the 5 day course in conjunction with the University of Southern Maine and Northern Maine Technical College. Participants may elect to take the course for academic credit and continuing education units. Tuition reduction is available for multiple enrollments from one district.

Dates and Locations:

- ⇒ June 17-21 Northern Maine Technical Center
- ⇒ June 24-28 University of Southern Maine

For more information, contact Lynne Lamstein in the Safety Division at 624-6460.

Did You Know?

Wood Dust is now classified as a known human carcinogen. Requirements of the Hazard Communications Standard 1910.1200 and 1926.59 include obtaining updated MSD sheets and informing employees of the new hazard. Manufacturers of wood products will need to modify their material safety data sheets to include the new information. The current 8 hour permissible exposure limit (PEL) for wood dust is set at 5 mg/m³ for respirable size particles. OSHA will be considering revising exposure limits for many chemicals during proposed rulemaking scheduled for July 1996. Will the PEL drop to the current ACGIH (American Conference of Governmental Industrial Hygienists) limit of 1 mg/m³ for hardwoods? To stay ahead of the regulations, replace worn tools with vacuum assisted units, maintain your dust collection systems, and monitor employee exposures.

For a look at what may become the new PELs, obtain the ACGIH Threshold Limit Values booklet by calling (513)-742-2020. The TLVs are revised yearly and indicate the current safe exposure limits as indicated through ongoing research.

Under a proposed rule, all employers will be required to develop a comprehensive safety and health plan. If you are interested in getting started with such a plan, the Bureau of Labor Standards can offer you an evaluation tool. Call (207)-624-6460 and ask for the Program Evaluation Profile (PEP). This questionnaire helps track your progress to a successful health and safety program.

Electrical Safety

By Kenneth D. Fox

Introduction

Electricity is a basic and natural form of energy. It has become a major power source in our industrialized culture for two major reasons: 1) Electricity is easily produced from multiple sources (i.e., hydro and nuclear), and 2) more importantly, electrical power is the easiest to distribute over large areas using conductors.

Control the Flow

The flow of electrons from a source (e.g., outlet) back to the same source through a conductor (e.g., a copper wire) and a motor converts electrical energy to mechanical energy. The path of electron flow is controlled by providing a conductive wire covered with an insulator that isolates the flow of electrons. Determining the path of flow and maintaining a barrier between the conductor, your body, and any unwanted objects is the key to preventing electrical injuries and the loss of property.

Electrical Flow

So what are the hazards?

When electrons flow through an object, they produce heat. A good example is a light bulb. Electricity can be a source of sparks that can ignite fires which cause burns. A frayed, energized light cord can lead to burns. Cords with worn insulation hidden under things such as rugs, can lead to injury due to unwanted electron flow through the rug.

Electricity and the Human Body:

Our bodies use electrical signals to regulate our heart rhythms and nervous system. If our bodies become a path or a conductor, with all our water salt and minerals, our muscles contract, our skin burns, and our heart can be stopped. If the flow causes our muscles to contract, we could be caught holding on to the conductor and burning.

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Upcoming Safety & Health Training Classes in Maine April-June, 1996

<u>Title</u>	<u>Date</u>	<u>Offered By</u>	<u>Phone Number</u>
Certified Logging Professional Certification (Skowhegan)	4/1-4/4	Certified Logging Professional Prog.	(207)-668-2851
HAZWOPER (OSHA 40 Hour)—(Auburn)	4/1-4/5	Central Maine Technical College	(207)-784-2385
Certified Logging Professional Certification (Dover)	4/2-4/5	Certified Logging Professional Prog.	(207)-668-2851
Accident Investigation (Portland)	4/2	Maine Safety Council	(207)-772-0506
Accident Investigation (Brewer)	4/4	Maine Safety Council	(207)-772-0506
EPA/HUD/ME Lead Training (Presque Isle)	4/8-4/12	Industrial Hygiene/New England	(207)-947-6645
Certified Logging Professional Certification (Orono)	4/8-4/11	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Certification (Princeton)	4/9-4/12	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Certification (Lincoln)	4/9-4/12	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Certification (Farmington)	4/15-4/18	Certified Logging Professional Prog.	(207)-668-2851
Asbestos Designer Review (Bangor)	4/16	Industrial Hygiene/New England	(207)-947-6645
Certified Logging Professional Certification (South Paris)	4/16-4/19	Certified Logging Professional Prog.	(207)-668-2851
Asbestos Worker Review (Bangor)	4/17	Industrial Hygiene/New England	(207)-947-6645
Asbestos Awareness for Custodians (Auburn)	4/17 & 6/20	Central Maine Technical College	(207)-784-2385
Asbestos Building Inspector Review & Air Monitor (Bangor)	4/18	Industrial Hygiene/New England	(207)-947-6645
Asbestos Supervisor Review (Bangor)	4/19	Industrial Hygiene/New England	(207)-947-6645
Asbestos Abatement Worker Refresher (Auburn)	4/19	Central Maine Technical College	(207)-784-2385
OSHA HAZWOPER (Presque Isle)	4/22-4/25	Industrial Hygiene/New England	(207)-947-6645
Certified Logging Professional Certification (Fort Kent)	4/22-4/25	Certified Logging Professional Prog.	(207)-668-2851
OSHA 30 Hour General Industry Certification (Auburn)	4/22-4/25	Central Maine Technical College	(207)-784-2385
Certified Logging Professional Certification (Houlton)	4/23-4/26	Certified Logging Professional Prog.	(207)-668-2851
Confined Space Rescue Refresher (Plymouth)	4/23	Burgess & Associates	1-800-773-2723
OSHA & Workers' Compensation Recordkeeping (Portland)	4/23	Maine Safety Council	(207)-772-0506
OSHA & Workers' Compensation Recordkeeping (Brewer)	4/25	Maine Safety Council	(207)-772-0506
Asbestos Abatement Supervisor Refresher (Auburn)	4/26	Central Maine Technical College	(207)-784-2385
HAZMAT/HAZWOPER (Presque Isle)	4/26	Industrial Hygiene/New England	(207)-947-6645
OHS Conference: "Change-Leaving the Past, Seeking the Future"	4/26	Central Maine Technical College	(207)-784-2385
Certified Logging Professional Certification (Lincoln)	4/29-5/2	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Certification (Skowhegan)	4/30-5/3	Certified Logging Professional Prog.	(207)-668-2851
Respirators (Both Portland & Brewer)	May	Maine Safety Council	(207)-772-0506
Safety Committees (Both Portland & Brewer)	May	Maine Safety Council	(207)-772-0506
Asbestos Air Monitor (Auburn)	5/3 & 5/10	Central Maine Technical College	(207)-784-2385
Certified Logging Professional Recert. (Lincoln, Princeton)	5/6	Certified Logging Professional Prog.	(207)-668-2851
Industrial Hygiene Basics (Auburn)	5/6	Central Maine Technical College	(207)-784-2385
Non-Abusive Psychological & Physical Intervention (Lewiston/Auburn)	5/6 & 5/7	NAPPI, Inc.	1-800-358-6277
Certified Logging Professional Recert. (Houlton, Ashland)	5/7	Certified Logging Professional Prog.	(207)-668-2851
Non-Abusive Psychological Recertification (Lewiston/Auburn)	5/8	NAPPI, Inc.	1-800-358-6277
Certified Logging Professional Recert. (Fort Kent)	5/8	Certified Logging Professional Prog.	(207)-668-2851
HAZWOPER Refresher (Auburn)	5/8 or 6/18	Central Maine Technical College	(207)-784-2385
Certified Logging Professional Recert. (Stratton)	5/13	Certified Logging Professional Prog.	(207)-668-2851
OSHA 30 Hour Construction Certification (Auburn)	5/13-5/16	Central Maine Technical College	(207)-784-2385
Certified Logging Professional Recert. (Farmington)	5/14	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Recert. (Rumford)	5/15	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Recert. (Skowhegan)	5/21	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Recert. (Dover)	5/22	Certified Logging Professional Prog.	(207)-668-2851
Certified Logging Professional Recert. (Orono)	5/23	Certified Logging Professional Prog.	(207)-668-2851
Asbestos Abatement Worker Refresher (Auburn)	5/28-5/31	Central Maine Technical College	(207)-784-2385
Forklift Safety (Both Portland & Brewer)	June	Maine Safety Council	(207)-772-0506

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Upcoming Safety & Health Training Classes in Maine April-June, 1996

Lead Based Paint Abatement Worker (Auburn)	6/3-6/6	Central Maine Technical College	(207)-784-2385
Lead Based Paint Abatement Supervisor (Auburn)	6/3-6/7	Central Maine Technical College	(207)-784-2385
Confined Space Rescue Refresher (Plymouth)	6/12	Burgess & Associates	1-800-773-2723
"New Direction in Lead - 2" Conference (Auburn)	6/13-6/14	Central Maine Technical College	(207)-784-2385
Asbestos Air Monitor Refresher (Auburn)	6/21	Central Maine Technical College	(207)-784-2385
Asbestos Air Analyst Refresher (Auburn)	6/21	Central Maine Technical College	(207)-784-2385
LEP Inspector Training (Auburn)	6/25-6/28	Central Maine Technical College	(207)-784-2385

The Center For Health Promotion (Tel. 1-800-879-LEAD) offers the following Courses in Lead-Based Paint Abatement:

- Refresher Course in Portland on 5/16.
- Respiratory Protection in the Workplace: An Overview for Managers & Supervisors in Portland on 4/18.
- Property Owners & Encapsulation in Portland on 4/22.
- Training For Workers & Supervisors in Portland 4/4-4/5 & 4/8-4/10; in Augusta 5/6-5/10; in Portland 6/6-6/7 & 6/10-6/12; in Bangor 6/24-6/28.
- Hazardous Waste Management Training in Portland on 5/21.
- Lead in Construction in Portland on 6/20.

The Pine Tree Chapter of the American Red Cross in Bangor (Tel. (207)-941-2903) offers the following courses in the Bangor area:

- ◆ Standard First Aid (with Adult CPR). Each class is from 8:00 a.m. to 4:00 p.m.. Classes are on 4/13, 4/25, 5/11, 5/23, 6/8, 6/20.
- ◆ Community First Aid & Safety (with Adult CPR). Class times vary. Classes are on 4/8, 10 & 11; 4/20; 5/6, 8 & 9; 5/18; 6/3, 5 & 6; 6/15.
- ◆ CPR Recertification (with Adult, Infant, and Child CPR). Each class is from 8:00 a.m. to 12 p.m.. Classes are on 4/27, 5/25, 6/22.
- ◆ CPR for the Professional Rescuer (with Adult, Infant, Child, Two-Person CPR). Call for dates.
- ◆ Emergency Response (42 hour advanced first aid). Class in April.

Scene Safety in Readfield (Tel. (207)-685-3185) offers classes in CPR, First Aid, Bloodborne Pathogens, Fire Extinguishment, Video Display Terminals Ergonomics, Hazard Material Awareness, and Handling Carbon Monoxide Emergencies.

Industrial Hygiene/New England (Tel. (207)-947-6645 offers the following classes sometime during the months of May and June: Lead Abatement Worker Training, Lead Worker Refresher Training, Lead Abatement Supervisor Training, Lead Supervisor Refresher Training, Asbestos Worker Initial Course, Asbestosis Supervisor Initial Course, Hazardous Waste Operations, HAZMAT/HAZWOPER Refresher, Asbestos O & M Initial Course, Asbestos Air Monitor Review, Asbestos Supervisor Review, Asbestos Worker Review, Asbestos Building Insp. Review, Asbestos Designer Review, and Indoor Air Quality Seminar.

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Protection

Identify the source and ensure that all conductors are insulated from unwanted contact. Do not allow yourself to become a conductor. Remember your "Two I's": Insulate and Isolate to control the path of electricity.

Sources

The local power company distributes electricity to the service entrance and the wiring (conductors) distribute the 120 volts to the outlet plug. At the outlet, the potential energy is ready for use and requires a path and a load—like an appliance that transforms electrical energy, so you can heat your morning coffee.

More injuries occur at 120 volts than any other source because of its widespread use. Burns, electrical shock, heart failure and loss of property can be caused by an electrical arc.

Ground Fault Circuit Interrupters (G.F.C.I.'s)

G.C.F.I.'s are used to control the path of electron flow by identifying flow through the hot wire and neutral wire. If they are different by a small amount, the

assumption is that the hot wire has found another path through your body or another good conductor like water. G.F.C.I. outlets are required within 6 feet of a sink, roof outlet, garage, outside outlets, pools/hot tubs. The outlets are very inexpensive and may save your life.

Conclusion

Electricity is everywhere—in our work and in our homes. Remember your "Two I's"—insulate and isolate. Don't allow your body or an object to become an unwanted path to ground.

Mr. Fox is a Safety & Loss Control Consultant for the Dunlap Corporation.

Articles are written by individual authors and are not products of the Bureau of Labor Standards or the editors. Information in the articles should not be viewed as a substitute for policy or for regulations. The editors are Bradford Brown, Planning & Research Associate II and Jonathan Lepoff, Staff Development Coordinator.

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